



**THE DATASHEET OF
H11B815SD**



H11B815

4-Pin Photodarlington Optocoupler

Description

The H11B815 consists of a gallium arsenide infrared emitting diode driving a silicon Darlington phototransistor in a 4-pin dual in-line package.

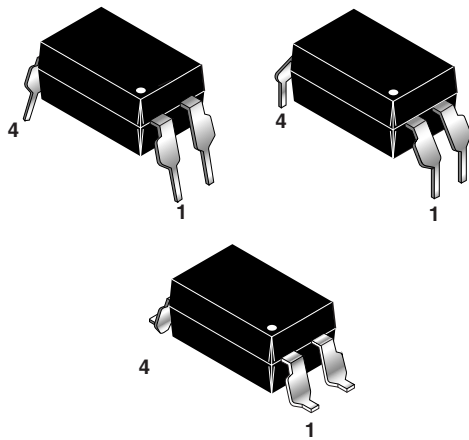
Features

- Compact 4-pin package
- Current Transfer Ratio: 600% minimum (at $I_F = 1 \text{ mA}$)
- High isolation voltage between input and output (5300 VRMS)
- UL recognized (File # E90700)

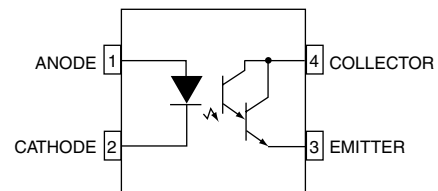
Applications

- Power Supply Monitors
- Relay Contact Monitor
- Telephone/Telegraph Line Receiver
- Twisted Pair Line Receiver
- Digital Logic/Digital Logic

Package



Schematic



Absolute Maximum Ratings (No derating required up to 85°C)

| Parameter | Symbol | Value | Units |
|---|------------------|----------------|-------|
| TOTAL DEVICE | | | |
| Storage Temperature | T_{STG} | -55 to +150 | °C |
| Operating Temperature | T_{OPR} | -55 to +100 | °C |
| Lead Solder Temperature | T_{SOL} | 260 for 10 sec | °C |
| Total Device Power Dissipation @ $T_A = 25^\circ\text{C}$ | P_D | 250 | mW |
| EMITTER | | | |
| DC/Average Forward Input Current | I_F | 50 | mA |
| Reverse Input Voltage | V_R | 6 | V |
| Forward Current - Peak (1 μs pulse, 300pps) | $I_F(\text{pk})$ | 1 | A |
| LED Power Dissipation @ $T_A = 25^\circ\text{C}$ | P_D | 70 | mW |
| Derate above 25°C | | 1.33 | mW/°C |
| DETECTOR | | | |
| Collector-Emitter Voltage | V_{CEO} | 35 | V |
| Emitter-Collector Voltage | V_{ECO} | 6 | V |
| Continuous Collector Current | I_C | 80 | mA |
| Detector Power Dissipation @ $T_A = 25^\circ\text{C}$ | P_D | 150 | mW |
| Derate above 25°C | | 2.0 | mW/°C |

Electrical Characteristics ($T_A = 25^\circ\text{C}$ Unless otherwise specified.)**Individual Component Characteristics**

| Parameter | Test Conditions | Symbol | Min | Typ** | Max | Unit |
|-------------------------------------|--|------------|-----|-------|------|---------------|
| EMITTER | | | | | | |
| Input Forward Voltage | ($I_F = 20\text{ mA}$) | V_F | | 1.2 | 1.50 | V |
| Reverse Leakage Current | ($V_R = 6.0\text{ V}$) | I_R | | 0.001 | 10 | μA |
| DETECTOR | | | | | | |
| Collector-Emitter Breakdown Voltage | ($I_C = 1.0\text{ mA}$, $I_F = 0$) | BV_{CEO} | 35 | 60 | | V |
| Emitter-Collector Breakdown Voltage | ($I_E = 100\ \mu\text{A}$, $I_F = 0$) | BV_{ECO} | 6 | 8 | | V |
| Collector-Emitter Dark Current | ($V_{CE} = 10\text{ V}$, $I_F = 0$) | I_{CEO} | | 0.005 | 1 | μA |
| Capacitance | ($V_{CE} = 0\text{ V}$, $f = 1\text{ MHz}$) | C_{CE} | | 8 | | pF |

Transfer Characteristics

| DC Characteristic | Test Conditions | Symbol | Min | Typ** | Max | Units |
|---|--|---------------|-----|-------|-------|---------------|
| Current Transfer Ratio, Collector-Emitter | ($I_F = 1 \text{ mA}$, $V_{CE} = 2 \text{ V}$) | CTR | 600 | | 7,500 | % |
| Saturation Voltage | ($I_F = 20 \text{ mA}$, $I_C = 5 \text{ mA}$) | $V_{CE(sat)}$ | | 0.8 | 1.0 | V |
| Rise Time (non saturated) | ($I_C = 10 \text{ mA}$, $V_{CE} = 2 \text{ V}$, $R_L = 100\Omega$) | t_r | | | 300 | μs |
| Fall Time (non saturated) | ($I_C = 10 \text{ mA}$, $V_{CE} = 2 \text{ V}$, $R_L = 100\Omega$) | t_f | | | 250 | μs |

Isolation Characteristics

| Characteristic | Test Conditions | Symbol | Min | Typ** | Max | Units |
|--------------------------------|--|-----------|-----------|-------|-----|----------|
| Input-Output Isolation Voltage | ($I_{I-O} [1 \mu\text{A}, 1 \text{ min.}]$) | V_{ISO} | 5000 | | | Vac(rms) |
| Isolation Resistance | ($V_{I-O} = 500 \text{ VDC}$) | R_{ISO} | 10^{11} | | | Ω |
| Isolation Capacitance | ($V_{I-O} = \&, f = 1 \text{ MHz}$) | C_{ISO} | | 0.5 | | pf |

** All typicals at $T_A = 25^\circ\text{C}$

Typical Performance Curves

Fig. 1 Normalized Current Transfer Ratio vs. Forward Current

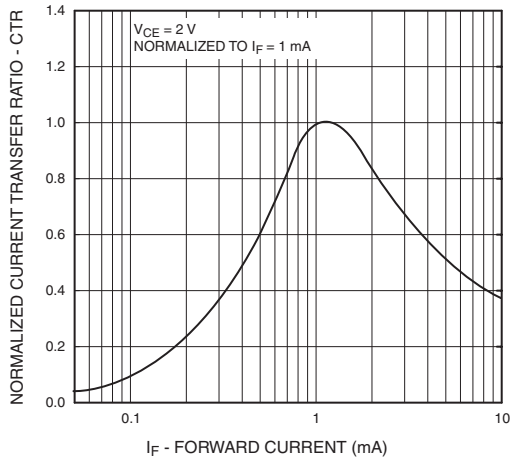


Fig. 2 Normalized Current Transfer Ratio vs. Ambient Temperature

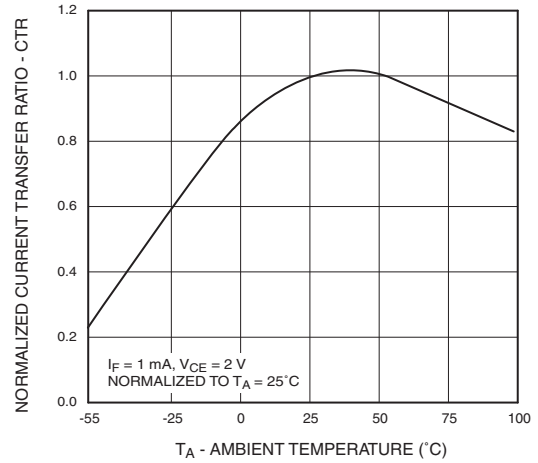


Fig. 3 Normalized Collector Current vs. Collector Emitter Voltage

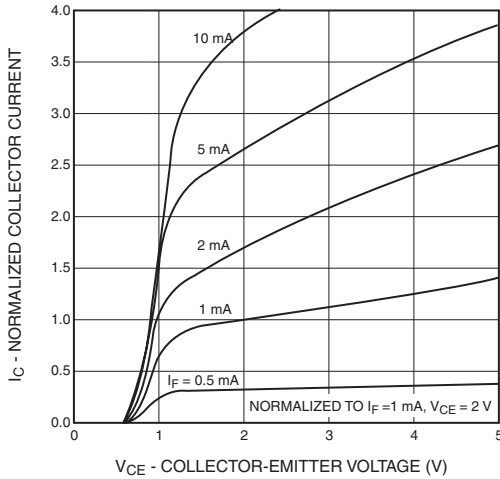


Fig. 4 Collector-Emitter Dark Current vs. Ambient Temperature

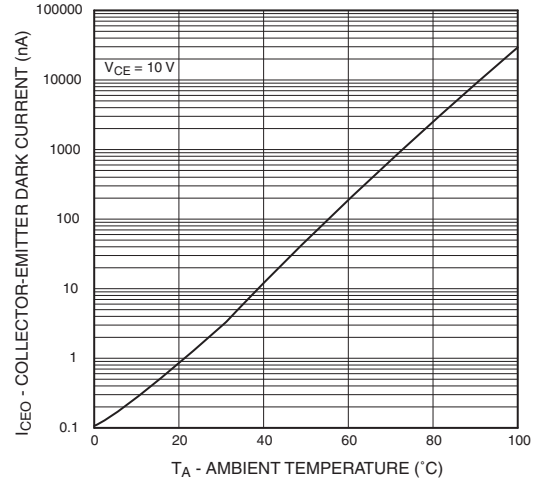
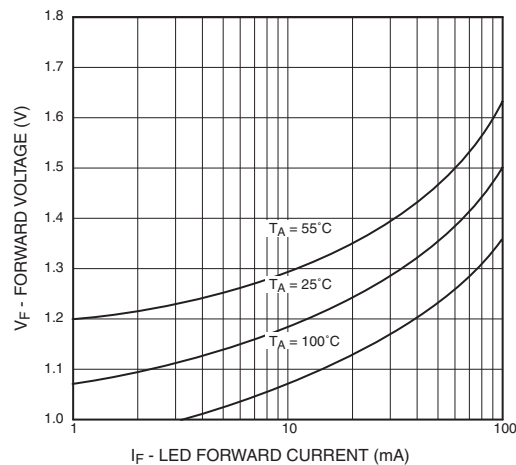
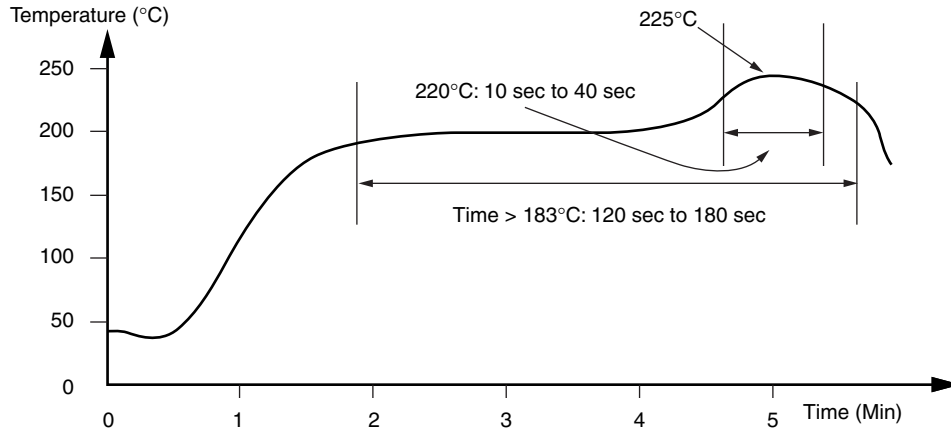


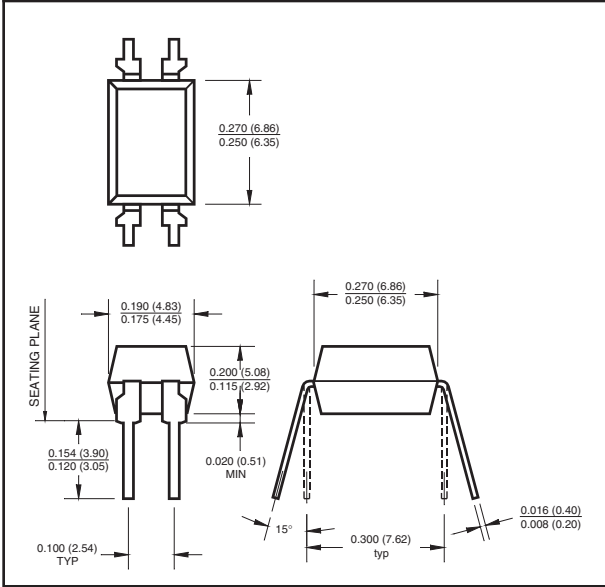
Fig. 5 LED Forward Voltage vs. Forward Current



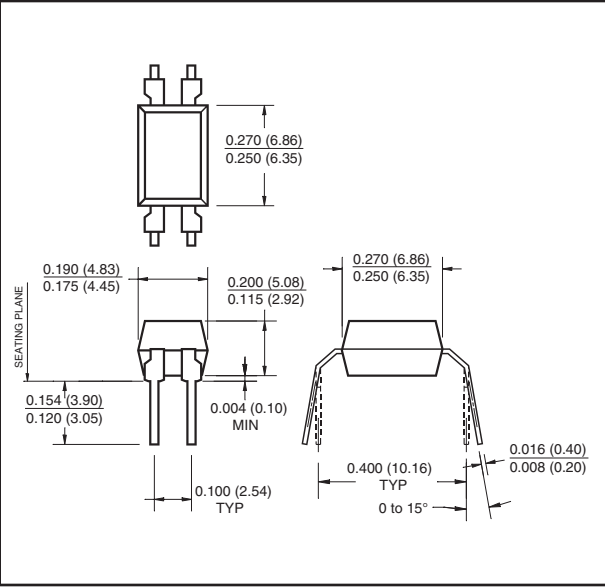
Recommended Thermal Reflow Profile for Surface Mount DIP Package



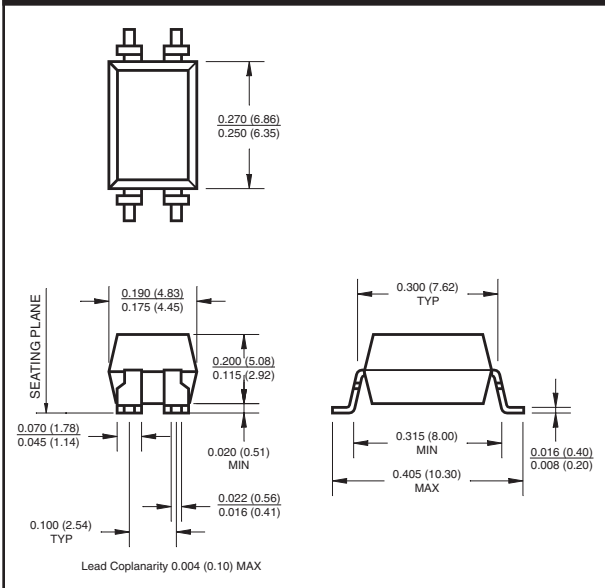
Package Dimensions (Through Hole)



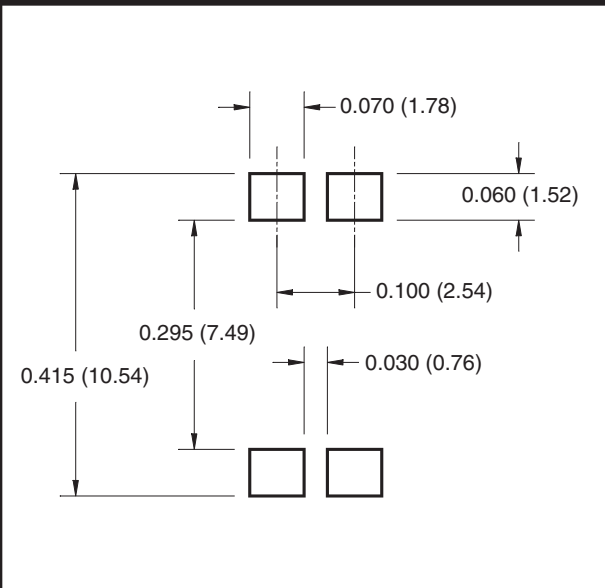
Package Dimensions (0.4" Lead Spacing)



Package Dimensions (Surface Mount)



PCB Footprint Layout

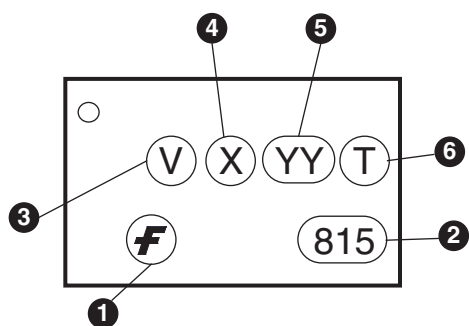


NOTE
All dimensions are in inches (millimeters)

Ordering Information

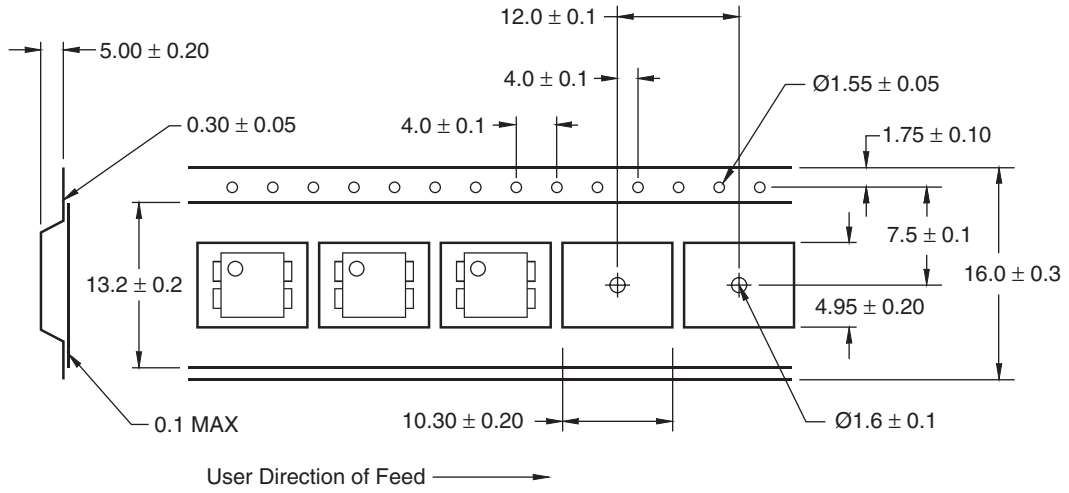
| Option | Order Entry Identifier | Description |
|--------|------------------------|--------------------------------------|
| S | .S | Surface Mount Lead Bend |
| SD | .SD | Surface Mount; Tape and reel |
| W | .W | 0.4" Lead Spacing |
| 300 | .300 | VDE 0884 |
| 300W | .300W | VDE 0884, 0.4" Lead Spacing |
| 3S | .3S | VDE 0884, Surface Mount |
| 3SD | .3SD | VDE 0884, Surface Mount, Tape & Reel |

Marking Information



| Definitions | |
|-------------|--|
| 1 | Fairchild logo |
| 2 | Device number |
| 3 | VDE mark (Note: Only appears on parts ordered with VDE option – See order entry table) |
| 4 | One digit year code |
| 5 | Two digit work week ranging from '01' to '53' |
| 6 | Assembly package code |

Carrier Tape Specifications



NOTE

All dimensions are in millimeters

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| DOME™ | HiSeC™ | MSX™ | RapidConfigure™ | UltraFET® |
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| | | PowerEdge™ | SuperSOT™-6 | |

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PRODUCT STATUS DEFINITIONS



Definition of Terms

| Datasheet Identification | Product Status | Definition |
|--------------------------|------------------------|---|
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